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No to NOE: Neoproterozoic Oxygen in the Early Flood Year

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How was the Flood Sediment Record Formed?

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A daunting challenge for Flood geology is identifying the actual explanation for how the staggering volume of sediment from the fossil-bearing portion of the rock record was eroded, transported, and deposited in orderly patterns on the surface of the normally high-standing continents in only a few months' time. This presentation reviews numerical modeling results showing that repetitive giant tsunamis generated by catastrophic plate tectonics during the Genesis Flood plausibly account for major aspects of the Flood sediment record (Baumgardner 2018). The calculations indicate that tsunami-driven cavitation erosion of bedrock during the Genesis Flood produces staggering volumes of new sediment, that tsunami-driven pulses of turbulent water can transport this sediment vast distances across the continental surfaces, and that these hydrological processes generate sequences of laterally extensive layers typically separated by erosional unconformities. Notably, the model incorporates a representation of the dynamic history of the continental blocks to account for the effects of continental motion. It also includes an initial continental topography, with low elevations along the coasts and higher elevations inland. This computational study provides important insight regarding the primary source of the Flood water, how that water was able to cover the normally high-standing continent surface, what produced and sustained the water flow, primary sources of the sediment, primary means of sediment transport and deposition across the continent surface, why so little erosional channeling occurred between sediment layers, the processes responsible for observed paleocurrent directions, and mechanisms responsible for the abundance of planar erosional features at many scales. Remarkably, the numerical simulation produces a large-scale distribution of sediment thickness on the continents at the end of the cataclysm that is astonishingly similar to what is actually observed today. Finally, it provides clues to likely causes for the striking global erosional unconformities between mega-sequences and for the rapid runoff of water from the continent surfaces at the cataclysm's end.

Baumgardner, J. 2018. Understanding how the Flood sediment record was formed: The role of large tsunamis. In Whitmore, J.H., ed., *Proceedings of the Eighth International Conference on Creationism*, Creation Science Fellowship, Pittsburgh, pp. 287–305.

An Examination of the Dominant Rock Type by Megasequence from the Late Precambrian to Neogene Across Four Continents

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Sequences or megasequences are defined as discrete packages of sedimentary rock bounded top and bottom by erosional surfaces, often with sandstone layers at the base (Sloss 1963). Subsequent megasequences formed as sea level repetitively rose and fell, resulting in flooding of portions of the continents beginning in the Late Precambrian (Austin and Wise 1994) and up to six times in the Phanerozoic (Sloss 1963; Hallam 1984; Haq et al. 1988). Upper erosional boundaries were created as each new megasequence eroded the top of the earlier megasequence as it advanced. Megasequence boundaries have been correlated from North America to South America and Europe (Soares et al. 1978). These same megasequence boundaries were assumed to be present in Africa as South America and Africa were one land mass up until the Cretaceous.

We used well logs, measured outcrops, and cross-sections and seismic data tied to well control from hundreds of available sources to construct over 2000 stratigraphic columns across Europe, North and South America, and Africa and the Middle East. The columns are the actual rocks in place at each location, from pre-Quaternary to the local basement. We input detailed lithologic data, megasequence boundaries and location coordinates into RockWorks 17, a commercial software program for geologic data, available from RockWare, Inc. Golden, CO. A graphics program in RockWorks 17 allowed us to record the dominant lithology in each megasequence.

Although many megasequences begin with a basal sandstone, our results show major lithological differences across the continents within many of the megasequences. For example, not all megasequences begin with a sandstone layer, sometimes a carbonate-rich layer was deposited directly on top of an earlier megasequence.

In addition, the dominant lithology present in each megasequence often has no relation to the basal deposit in each megasequence. For example, the Sauk megasequence across North America begins with an extensive sandstone layer, but the overall megasequence is dominated by carbonate deposition. And even though North America was dominated by carbonate rock in the earliest megasequences, most of the other continents were simultaneously dominated by clastic deposition.

A major change in deposition occurred globally by the time of

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deposition of the Absaroka megasequence. Here, we see many changes in the dominant rock types being deposited on several continents. North America became increasingly more dominated by clastics and Europe, Africa and South America exhibit many new areas of carbonate and salt deposition.

Another major shift occurred in the Zuni megasequence, the most extensive of all the megasequences. In this megasequence, carbonate-rich rocks dominated the newly formed Gulf of Mexico region and most of Southern Europe and North Africa and the Middle East. This extensive deposition of carbonate-rich rocks continued through the Tejas across the Mediterranean region and parts of North Africa and the Middle East and the eastern Gulf of Mexico.

Volcanic-rich rocks, including tuffs, ash layers and lava flows, first became a dominant rock type in the Absaroka, and this trend continued through both the Zuni and the Tejas, where they were also widespread.

Mapping the dominant rock type in each megasequence is a new way to visualize the layer-by-layer deposition of the global Flood. Further, it reduces the emphasis on basal rock types and gives a better representation of the rocks that were actually deposited in each location.

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No to NOE: Neoproterozoic Oxygen in the Early Flood Year

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It has been claimed that there was a Neoproterozoic rise in atmospheric oxygen (Och and Shields-Zhou 2012). This inferred episode is called the "Neoproterozoic Oxygenation Event" (NOE) (Dickens 2018). The timing and magnitude of the NOE remains poorly determined (Och and Shields-Zhou, 2012), along with its alleged unidirectional increase and supposed enabling evolution of early animal life (Sahoo et al. 2016). However, in a biblical young Earth history framework, there was sufficient oxygen early in Earth history to support land and sea life, which were subsequently buried and fossilized during the Flood Year.

The redox environment of ancient sediments is inferred from a number of proxies. Chemical data indicate a dynamic environment with phases of both oxidation and reduction. The δ13C value of carbonates, shows significant variations throughout the Neoproterozoic. Uranium isotope evidence for global marine oxygenation and return to anoxic conditions suggests that Neoproterozoic oxygenation was not an irreversible, stepwise increase in oxygenation. At least one major interval of oxygenation after deposition of Sturtian strata was followed by a return to widespread anoxia prior to deposition of Marinoan strata. (Lau et al. 2017). Similarly, cerium depletion studies (Wallace et al. 2017) suggest there was protracted and irregular oxygenation increase that extended well into Phanerozoic strata. Integrated data for sulfur isotope patterns in pyrite, iron speciation analysis, and redox-sensitive elements from euxinic shales of a deep-water section in South China, indicate multiple oxygenation events in overall anoxic strata (Sahoo et al. 2016).

The overall increase in $^{87}Sr/^{86}Sr$ ratio in Neoproterozoic to Cambrian marine sediments indicates erosion of more radiogenic continental crust and influx of resulting detritus to the ocean (Peters and Gaines 2012). This is consistent with massive erosion caused by stupendous rain early in the Flood Year, and resulting deposition of Neoproterozoic sediments (Dickens 2018). A massive influx of organic carbon from completely abraded animals would have created anoxic zones where decay consumed oxygen. However, increase in oxidized species in the Neoproterozoic stratigraphic record indicates movement of elements in a reduced state (such as S^{-2}, Fe^{2+}, and CH_4), from deeper water to above wave base and to the surface where they underwent oxidation by atmospheric oxygen. Precambrian-Cambrian transition phosphorite is associated with catastrophic ocean water mixing (deep anoxic and shallow oxic oceanic waters) as inferred from sulphur isotopes (Cook 1992). This is consistent with the action of very energetic fountains of the great deep. (Dickens and Snelling 2015).

We conclude that near surface oxidation of reduced sediments was the source of the supposed NOE and that Neoproterozoic sediments have been misinterpreted as indicators of significant atmospheric oxygenation. There was no massive change in atmospheric oxygen levels, but there was a massive global upheaval early in Noah's Flood.

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Advances in Modeling the Large-Scale Tectonics of the Genesis Flood

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Independent Scholar

Identifying and understanding the primary physical processes that operated during the Flood cataclysm involves a careful evaluation of a vast diversity of observations. These observations encompass detailed characteristics of the rocks at or near the earth's surface, including the fossils they contain, as well as estimates for the properties of the rocks in the earth's deep interior. A critical component of the cataclysm is the large-scale tectonic change (Austin et al. 1994) that entirely replaced the floors of the oceanic portion of the earth's surface and displaced continents by thousands of miles (Baumgardner 2003). This paper will address the nature of this large-scale tectonic change by applying a numerical tool designed to model the flow of rock inside the mantle. The numerical tool is the 3D finite element code known as TERRA that has been applied to this problem in the past (Baumgardner 1993). The novel aspects of the simulations I describe include higher spatial resolution than ever before presented as well as a much more realistic treatment of mantle rock deformation properties. The paper will provide an overview of the plate motion history that accompanied the Flood beginning with a pre-Flood supercontinent sometimes referred to as Pannotia, centered near the south magnetic pole, which partially fragmented during the early stages of the Flood and then reassembled midway into the cataclysm as the supercontinent known as Pangea. That fragmentation and reassembly was accompanied by about 110° of motion of the south magnetic pole relative to the center of Pangea such that it then aligned closely with the earth's south rotational pole. The subsequent breakup of Pangea and associated seafloor spreading produced the continent configuration we have today, all within a few months' time during the Flood. I will also describe how these tectonic aspects of the cataclysm help to account for several of its other important consequences.

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How are Abrupt Climate Changes Explained in Ice Cores?

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Independent Scholar

In the 1990s, a paradigm shift took place in glacial paleoclimatology (Oard 1995). It came about because two deep ice cores, GISP2 and GRIP, drilled 28 km apart at the top of the Greenland Ice Sheet, showed that the oxygen isotope ratio fluctuated abruptly numerous times. Assuming that these oxygen isotope changes are due to temperature and the uniformitarian timescale, the oscillations record millennial-scale temperature changes of 10–20°C. Various chemicals are also correlated to these abrupt temperature oscillations. These are called Dansgaard-Oeschger (D-O) events. There are 25 D-O oscillations in the Greenland ice cores with a period of about 1,470 years. The youngest is called the Younger Dryas event which has been known for many years. In contrast, the Antarctica ice cores do not record abrupt changes.

These abrupt changes shocked secular scientists. The rate of change appears to have taken from a decade (Pausata et al. 2016) to as short as 1 to 3 years (Hammer et al. 1997)! The changes lasted for about a millennium or two and then shifted back again to the original oxygen isotope value. These events are truly sensational, since then there has been much speculation as to their cause: "The origin of major rapid, decadal climate change during the latest Quaternary remains an enigma" (Sarnthiem et al. 2000).

Abrupt climate shifts were rarely if ever seen in other post-Flood climate records before the GISP2 and GRIP ice cores were drilled. But once they were analyzed, the idea of catastrophic climate shifts took hold. It is interesting that researchers later 'discovered' them in many other climatic data sets on land and sea, as in deep sea cores and lake pollen data. They are also seen in the tropics (Pahnke et al. 2003; Rashid 2009). Sarnthein et al. (2000) state:

> "Since these first discoveries from the Greenland Summit cores in the early 1990s, the record of this unexpected climatic behavior has been found in many regions, including polar ice sheets; marine sediments of the Atlantic, Pacific, and Indian Oceans; and in terrestrial lakes and bogs."

This begs the question why were they not discovered before the early 1990s?

The abrupt climate changes have fueled the global warming debate suggesting that a climate threshold can be passed when the climate suddenly and rapidly changes to a more extreme state. Some have even suggested that global warming may be the trigger to throw the world into the next ice age.

Since these abrupt climate changes occurred during the Ice Age, I believe they are due to highs and lows in volcanism on a decadal timescale. Much more volcanism took place in the Northern Hemisphere than the Southern Hemisphere, which is why the latter do not have abrupt changes. From this we can conclude that an abrupt climate change will not occur today, neither caused by global warming (Oard 2011) nor some other mechanism. The tops of the cores from both Antarctica and Greenland show that there have been no significant climate changes since the Ice Age.

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How do the Greenland and Antarctica Ice Sheets fit into Biblical History?

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Independent Scholar

The Greenland and Antarctica Ice Sheets are thought to be a contradiction to the short biblical timescale. Uniformitarian scientists claim they developed millions of years ago. The East Antarctica Ice Sheet is said to have started developing in the Eocene reaching equilibrium in the Miocene at 15 Ma.

Initially, Antarctica was said to have developed in the Pleistocene or possibly as early as the late Pliocene. But later, the ice sheet was declared to be much older because of what are believed to be ice-rafted debris found in early Cenozoic deep-sea cores off the coast. Strahler (1987, p. 254) challenges us:

> "Increasing the duration of the Ice Age by a factor of about 10 greatly increases the stress upon the creation scientists, who must compress the events of 15 m.y. into 4,000 y. of post-Food time."

In the Creation/Flood Ice Age model, we would predict that the ice sheets mostly grew during the Ice Age and continued to grow several hundred years after the other ice sheets melted (Oard, 2005). So, our annual ice layers for the Ice Age would be meters thick, tailing off upward after the Ice Age. The flawed uniformitarian exercise of counting 'annual layers' can be explained within the Creation/Flood model as storm and substorm layers. Greenland and West Antarctica ice cores show only one Ice Age with a relatively warm beginning followed by post-Ice Age warming.

The East Antarctica deep ice cores are very different from the Greenland and West Antarctica ice cores, showing what are interpreted as up to eight ice ages, starting at about 800 ka, near the bottom of the ice sheet. These ice ages are based on multiple large oscillations in the deuterium isotope ratio, which is correlated to other variables. The cores are dated by wiggle matching with deep sea cores, which are dated by assuming the Milankovitch theory of ice ages.

How do creation scientists interpret the East Antarctica ice cores? I believe we can explain them by determining when all the ice core locations first accumulated snow and ice and by the rate of ice accumulation. The development of the Greenland and Byrd ice cores were likely delayed until about 200 years after the Flood. This is because the surrounding ocean was warm (Gollmer 2013, 2018). It is for this reason there is only one large oscillation in the oxygen isotope ratio recorded, and hence one Ice Age. The WAIS Divide ice core does not even record a full ice age, since the location started well below sea level. It would have taken time for the ice to start building at that location, possibly starting 300 years after the Flood.

The East Antarctica ice cores can be explained by the development of ice at the ice core locations within 50 years of the Flood. From methane oscillations, we can correlate the top 1,500 m of the East Antarctic ice cores to the Ice Age portion of the Greenland and West Antarctic ice cores. This suggests that the first 1,500 m of ice on East Antarctica built up *before* the ice began collecting on Greenland and West Antarctica. Therefore, the evidence compels me to believe that ice accumulated on East Antarctica at about 10 m/yr for the first 200 years due to the unique climate situation of a cold Antarctica continent adjacent to warm ocean water. The large oscillations in the East Antarctica ice core can be attributed to peaks and lulls in Southern Hemisphere volcanism on a decadal time scale.

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